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By K B Hemanth Raj

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15EC62

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
ARM Microcontroller & Embedded Systems

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing one full question from each module.***

Module-1

1 a. Explain the architecture of ARM cortex – M3 processor with the help of neat block diagram. **(10 Marks)**

b. List and explain the features of ARM cortex M3 processor. **(06 Marks)**

OR

2 a. Explain the operation modes and privilege levels in cortex M3 processor. **(08 Marks)**

b. Explain two stack model and reset sequence in ARM cortex M3. **(08 Marks)**

Module-2

3 a. Explain the following instruction with examples:
(i) ASR (ii) LSL (iii) ROR (iv) REV **(08 Marks)**

b. Briefly explain bit band operations and memory map of cortex M3. **(08 Marks)**

OR

4 a. Write a note on barrier instruction in cortex M3. **(06 Marks)**

b. With a diagram, explain the organization of CMSiS and its benefits. **(10 Marks)**

Module-3

5 a. Define embedded systems. Explain the 6 purpose of embedded systems with an example for each. **(08 Marks)**

b. Explain the classification of embedded systems based on generation. **(04 Marks)**

c. Mention the application of embedded system with an example for each. **(04 Marks)**

OR

6 a. Explain the different 'on board' communication interfaces in brief. **(08 Marks)**

b. Write a note on: (i) Reset circuit (ii) Watch dog timer. **(08 Marks)**

Module-4

7 a. Explain the different characteristics of embedded system in detail. **(08 Marks)**

b. With a block diagram, mention the components and in the design of a washing machine and also explain its working. **(08 Marks)**

OR

8 a. What is hardware and software co-design? Explain the fundamental design approaches in detail. **(10 Marks)**

b. With FSM model, explain the design and operation of automatic tea/coffee lending machine. **(06 Marks)**

Module-5

9 a. Define process. Explain in detail the structure, memory organization and state transitions of the process. **(08 Marks)**

b. Explain multi processing, multi tasking and multi programming. **(08 Marks)**

OR

10 a. Explain the simulator and emulator. **(08 Marks)**

b. Write a note on message passing. **(08 Marks)**

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